Appl. No. 09/941,300
Amdt. dated May 18, 2005
Reply to Office action of February 18, 2005

Amendments to the Claims:

Please amend claims 1, 4-9 and 12-14 as shown in the listing of claims below. This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) A reduced-state complexity equalizer apparatus for use with communication systems requiring equalization of a received signal subject to intersymbol interference (ISI), the apparatus comprising:

a first decision feedback equalizer device which utilizes coefficients derived from ~~the~~ an estimated channel response of a channel and forms tentative symbol decisions;

at least a second[[-]]_decision feedback equalizer device which utilizes coefficients derived from the estimated channel response and the tentative symbol decisions from the first decision feedback equalizer to truncate ~~the~~ a channel response of the channel to a desired channel memory; and

at least one non-linear equalizer device for providing equalization of the truncated channel response over the desired memory,

whereby ~~the~~ overall complexity of the equalizer is reduced by reducing ~~the~~ an effective delay spread of the channel.

2. (original) The reduced-state complexity equalizer apparatus of Claim 1, wherein the non-linear equalizer device includes a maximum-a-posteriori (MAP) equalizer device.

3. (original) The reduced-state complexity equalizer apparatus of Claim 1, wherein the non-linear equalizer device includes a maximum likelihood sequence estimator (MLSE) equalizer device.

4. (currently amended) The reduced-state complexity equalizer apparatus of Claim 1, wherein the first[[-]] decision feedback equalizer device includes a feed-forward filter and a feedback filter, and at least one second decision feedback equalizer device ~~that~~ includes a feedback filter.

5. (currently amended) The reduced-state complexity equalizer apparatus of Claim 4, wherein ~~the~~ coefficients of the feedback filter of the second[[-]]_decision feedback equalizer device ~~is~~ comprise a subset of those of the feedback filter of the first[[-]]_decision feedback equalizer device.

6. (currently amended) The reduced-state complexity equalizer apparatus of Claim 4, wherein post-cursor interference is subtracted from ~~the~~ an output of the feed-forward filter in the first[[-]]_decision feedback equalizer device and a hard symbol decision is made on this output.

7. (currently amended) The reduced-state complexity equalizer apparatus of Claim [[1]] 4, wherein the second[[-]] decision feedback equalizer device constructs partial post-cursor interference using the tentative decisions from the ~~output of the~~ first decision feedback equalizer, and subtracts the partial post-cursor interference from ~~the~~ an output of the feed-forward filter.

8. (currently amended) The reduced-state complexity equalizer apparatus of Claim 1, wherein ~~the~~ an output from the second[[-]]_decision feedback equalizer is provided as input to the non-linear equalizer device.

9. (currently amended) A method for reducing ~~the~~ complexity of an equalizer for use with a communication system requiring equalization of a received incoming signal subject to intersymbol interference (ISI), the method comprising the steps of:

deriving feedback and feed-forward coefficients for ~~the~~ associated feedback and feed-forward filters of a first and at least one subsequent decision feedback equalizer from ~~the~~ an estimated channel response of a channel;

utilizing the first decision feedback equalizer to form tentative decisions regarding certain symbols;

utilizing at least one subsequent decision feedback equalizer to truncate the channel response to a desired memory; and

utilizing at least one non-linear equalizer for providing equalization of the truncated channel response over the desired memory,

whereby ~~the~~ overall complexity of the equalizer is reduced by reducing ~~the~~ an effective delay spread of the channel.

10. (original) The method for reducing the complexity of an equalizer of Claim 9, wherein the non-linear equalizer includes a maximum-a-posterori (MAP) equalizer device.

11. (original) The method for reducing the complexity of an equalizer of Claim 9, wherein the non-linear equalizer includes a maximum likelihood sequence estimator (MLSE) equalizer.

12. (currently amended) The method for reducing the complexity of an equalizer of Claim 9, wherein the step of utilizing the first[[-]]_decision feedback equalizer includes reconstructing post-cursor interference using decisions made on previously detected symbols, subtracting the post-cursor interference from ~~the~~ an output of the feed-forward filter, and making a hard symbol decision on this output.

13. (currently amended) The method for reducing the complexity of an equalizer of Claim 9, wherein a further step of utilizing the second[[-]]_decision feedback equalizer includes: reconstructing partial post-cursor interference using the hard symbol decision from the first[[-]]_decision feedback equalizer[[,]] and subtracting the partial post-cursor interference from ~~the~~ an output of the feed-forward filter~~, and saving the~~ to obtain an output of the second decision feedback equalizer.

14. (currently amended) The method for reducing the complexity of an equalizer of Claim 13, wherein a further step of utilizing the non-linear equalizer includes: providing the output from the second[[-]] decision feedback equalizer as ~~the~~ an input to the non-linear equalizer.